

WHAT IS CLAIMED IS:

Sub 2

- 5 1. An electroporation assembly comprising:
a container having a distal opening, the container configured to receive a
conductive fluid including a substance;
a first electrode having at least a portion configured to be disposed within
the container and in direct electrical communication with the conductive fluid; and
a second electrode positioned in proximity to the distal opening for
creating an electric field between the electrodes.
- 10 2. An electroporation assembly according to claim 1 wherein the
container is selected from the group consisting of pipette, buret and syringe.
- 15 3. An electroporation assembly according to claim 2 wherein the pipette
is a micropipette.
- 20 4. An electroporation assembly according to claim 3 wherein the
micropipette is a glass pulled pipette having a sharp tip opening having a diameter less
than the diameter of a target cell.
- 25 5. An electroporation assembly according to claim 1 further comprising a
tissue support for maintaining a cell, tissue or an organism between the distal opening
and the second electrode.
- 30 6. An electroporation assembly according to claim 1 further comprising a
power supply.
7. An electroporation assembly according to claim 6 wherein the power
supply is a periodic pulse generator.

8. An electroporation assembly according to claim 1 wherein the first and second electrodes are independently made of a conductive material selected from the group consisting of silver, copper, stainless steel, aluminum, platinum, gold, carbon and alloys thereof.

9. A method for delivering a substance into a cell comprising:
providing a container having a distal opening;
placing a conductive fluid including a substance in the container;
placing the distal opening in proximity to the cell; and
causing an electrical signal to pass through the conductive fluid and the cell wherein the substance passes through the distal opening and enters the cell.

10. A method for delivering a substance into a cell according to claim 9 wherein the container is selected from the group consisting of pipette, buret and syringe.

11. A method for delivering a substance into a cell according to claim 10 wherein the pipette is a micropipette.

12. A method for delivering a substance into a cell according to claim 11 wherein the micropipette is a glass pulled pipette having a sharp tip opening having a diameter less than the diameter of the cell.

13. A method for delivering a substance into a cell according to claim 9 wherein the electrical signal passes between first and second electrodes, the first electrode having at least a portion thereof disposed within the container and in direct electrical communication with the conductive fluid.

14. A method for delivering a substance into a cell according to claim 9 wherein the cell is in direct contact with the distal opening.

15. A method for delivering a substance into a cell according to claim 9 wherein the substance is selected from the group consisting of nucleic acid, dye, protein, antibody, antigen, peptide, metal, pharmaceutical compound, a radiolabeled derivative of the foregoing and combinations thereof.

5

16. A method for delivering a substance into a cell according to claim 15 wherein the nucleic acid is contained in a vector.

10

17. A method for delivering a substance into a cell according to claim 15 wherein the dye is a fluorochrome.

18. A method for delivering a substance into a cell according to claim 15 wherein the protein is a fluorochrome.

15

19. A method for delivering a substance into a cell according to claim 18 wherein the protein is green fluorescent protein or a red shifted mutant thereof.

20

20. A method for delivering a substance into a cell according to claim 15 wherein the nucleic acid is a nucleic acid encoding a fluorescent protein.

21. A method for delivering a substance into a cell according to claim 20 wherein the fluorescent protein is green fluorescent protein or a color shifted mutant thereof.

25

22. A method for delivering a substance into a cell according to claim 9 wherein the electrical signal is generated by a periodic pulse generator.

23. A method for delivering a substance into a cell according to claim 22 wherein the electrical signal is a square pulse.

30

